OpEval II Data Collection Requirements

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Data Collection Objectives

- Maximize use of limited test resources
- Examine new concepts and procedures
- Obtain “credit” towards certification and operational approval

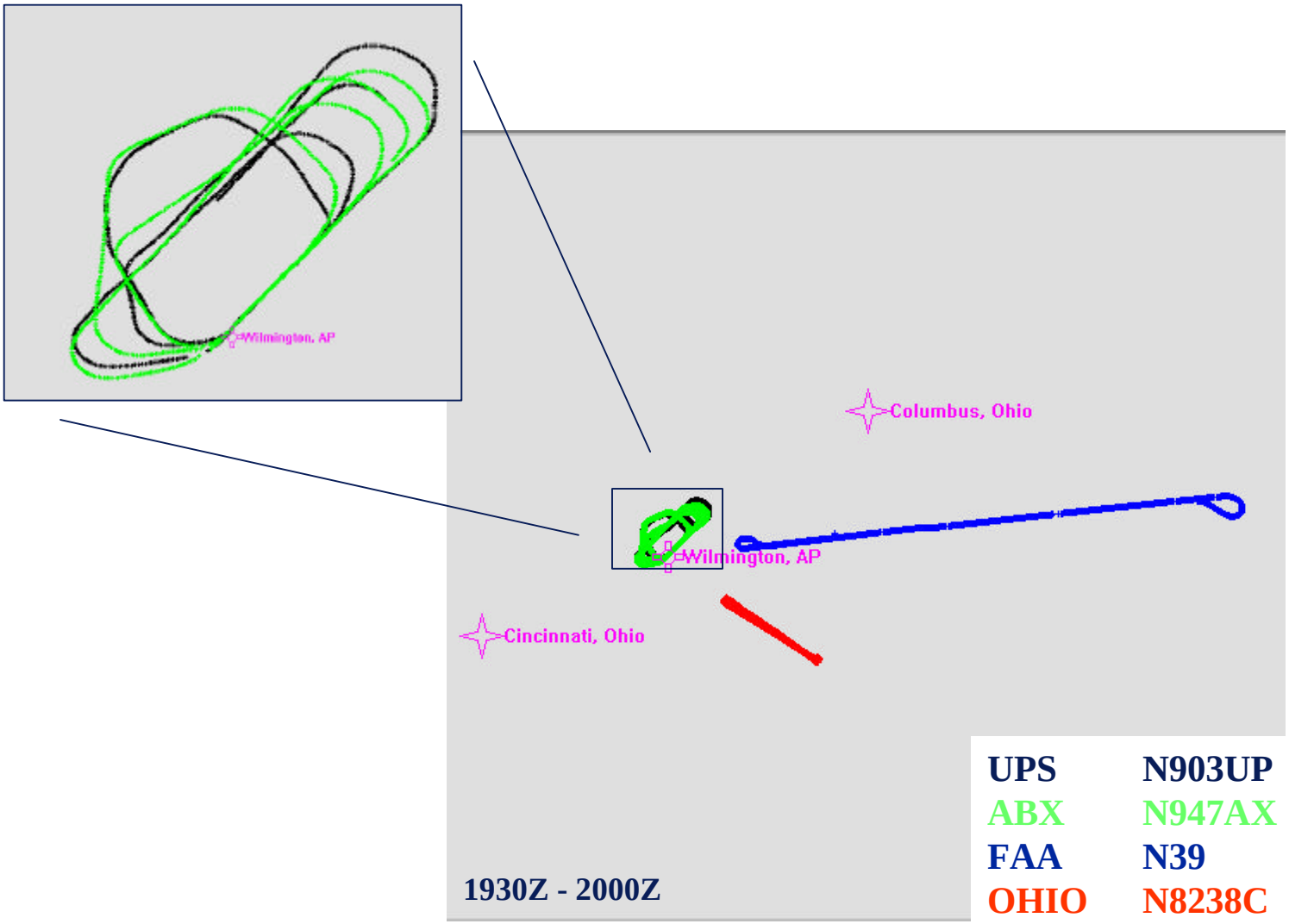
Categories

- Benefits and Constraints
- Operational Procedures
- Human Factors
- End-to-End Performance
- Interoperability Requirements
- Operational Safety Assessment
- Certification
- Operational Approval

Benefits and Constraints

- **Input from SF 21 Cost/Benefits Subgroup**
  - **Safety**
  - **User and FAA cost savings**
- **Metrics**
  - **Times and distances**
  - **Safety measured indirectly through survey**
- **Baseline Testing Issue**

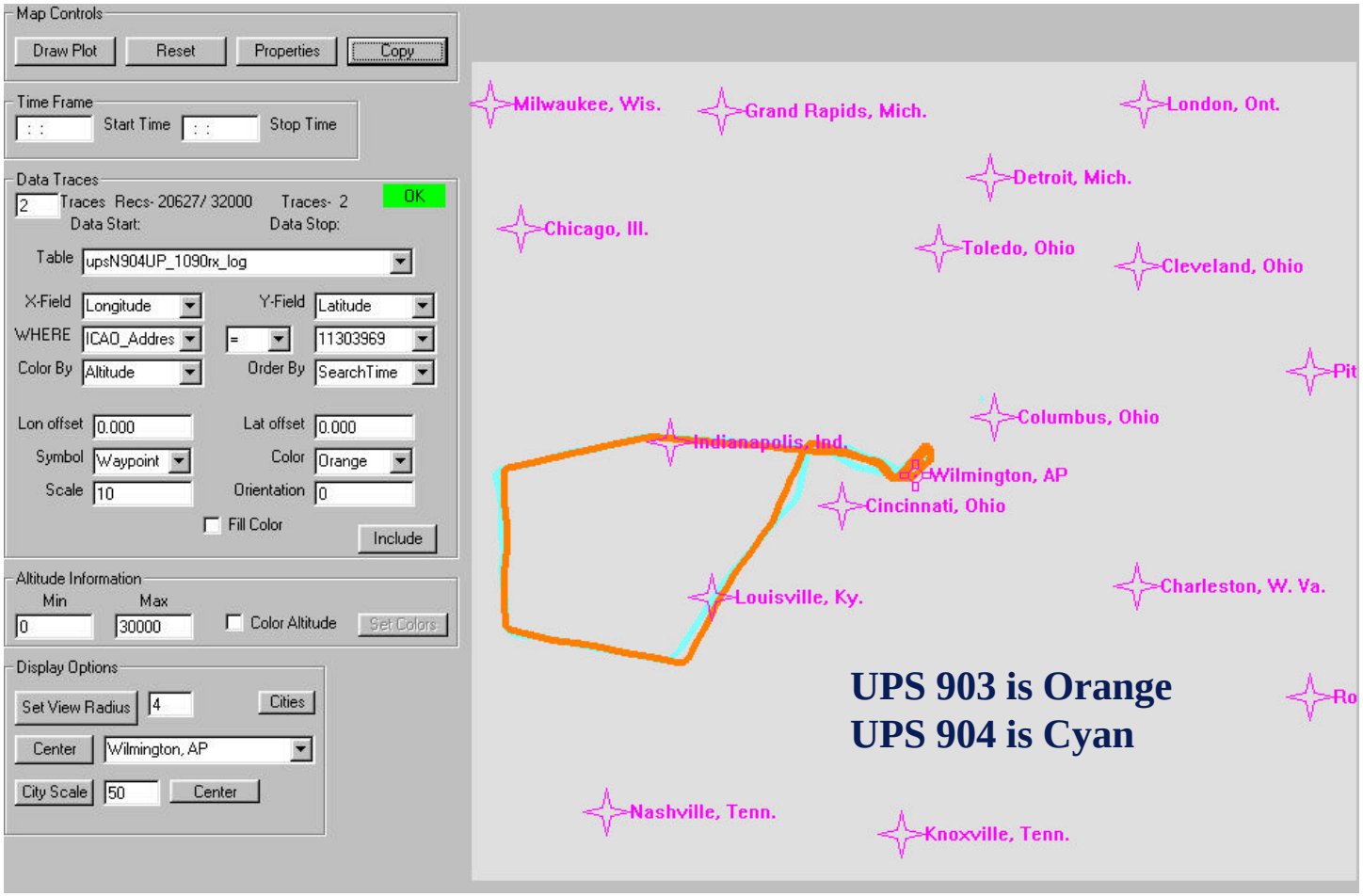
Times and Distances



Operational Procedures and Human Factors

- Input from the Requirements Evaluation Plan (REP)
  - Air Traffic led effort, but inputs from variety of sources
  - Test plan evaluation guide
  - No direct connection to certification and operational approval
  - Commissioning of ground infrastructure, changes to FAA Order 7110.65
- High level questions
  - Procedure changes, changes in roles
  - ATC, pilot information needs
  - Presentation
  - Mixed equipage

In-Trail Flight



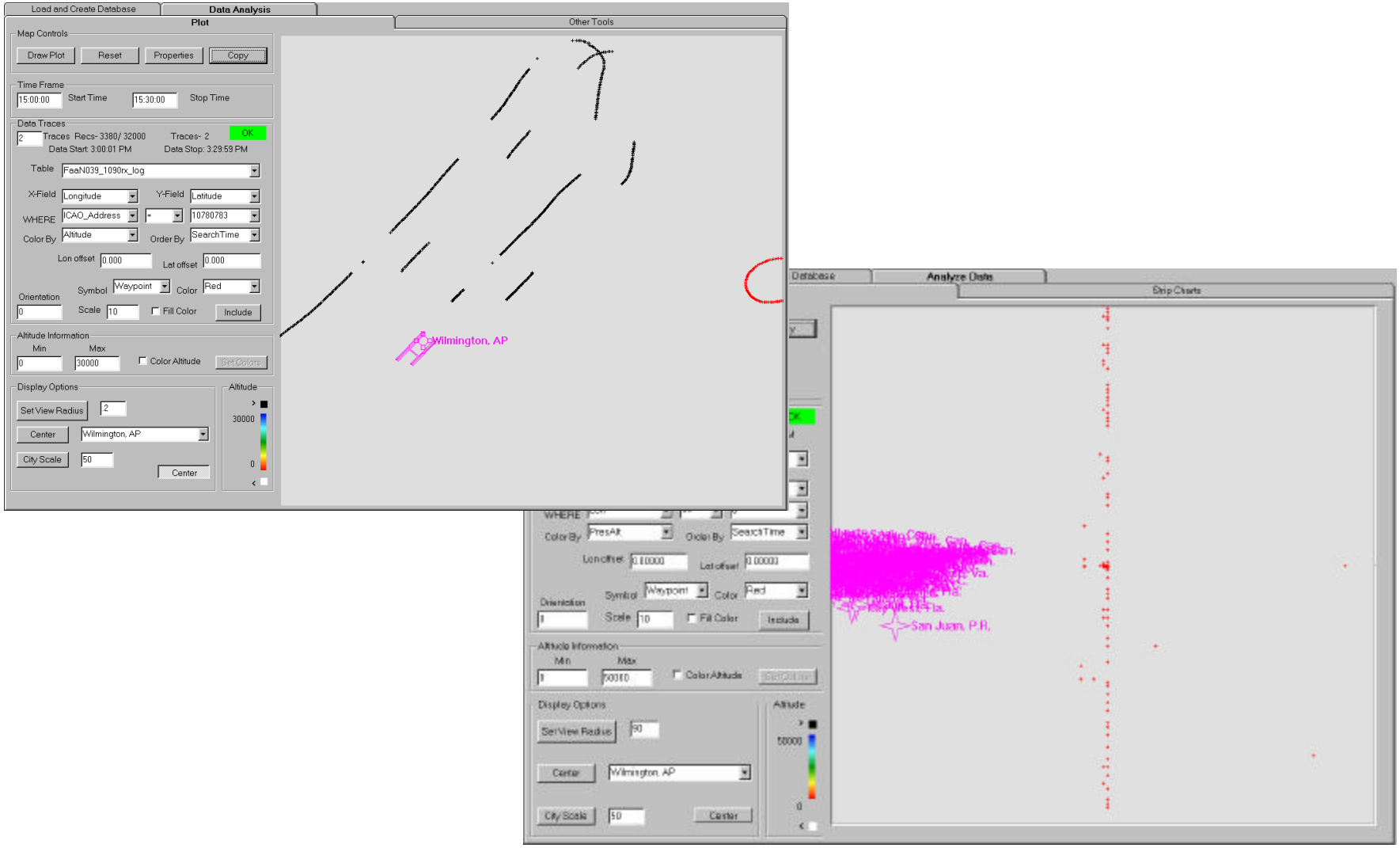
End-to-End Performance and Interoperability Requirements

- **Inputs from REP and Technical Link Assessment Team**
  - **Surveillance (fusion, mixed equipage)**
  - **Link evaluation**
- **Link Testing**
  - **Multipath, interference characterization**
  - **Testing not required to be performed at SDF or in conjunction with Op Eval II**
  - **Planning meeting in early August**
- **No specific data collection requirements**

Operational Safety Assessment

- Input from Operational Hazard Assessment (OHA)
  - Focused on severity, not probability of occurrence
  - Qualitative
  - Missing or misleading data, incorrect use, component failure
- Subsequent steps required for certification and operational approval
  - Steps
    - Preliminary System Safety Assessment
    - Functional Hazard Assessment
    - Safety and Performance Assessment
  - Studies and simulations conducted by the applicant, FAA
- No specific data collection requirements (identify anomalies)

Interesting Anomalies



Certification

- Inputs from AIR, ACO, TAD
  - List of issues
  - High priority issues identified
- Certification issues
  - Objectives
    - Intended function
    - Hazardous conditions/situations
  - Current certification process
    - Operational use, not experimental
    - Certifying hardware, software for Major hazard severity
  - OpEval II will not satisfy all certification requirements
    - Focus on LDPU v4, MX-20
    - Familiarity with advanced concepts
    - Test instrumentation
    - System conformity

Priority Certification Issues

- How accurate is ADS-B position data for each application and how well does it correlate with reality? How is the crew made aware of degraded system accuracy, either ownship or target aircraft? (Also, how accurate are the NUC/NIC values?)
- Evaluate the CDTI clutter issue (on the airport surface) for each application. Appropriate declutter mechanisms should be evaluated.
- Identify system level interoperability issues including the Interaction of LDPU v4 with infrastructure and with other manufacturers whose ADS-B equipment operates using Extended Squitter.
- Identify normal alerting events and anomalous occurrences. Why is it alerting? Why is it not alerting (in a situation when it appears that it should alert)? Capture the events and document in a the OpEval II final report.

Operational Approval

- **Inputs from AFS, FSDO, AEG**
  - **List of issues developed**
  - **Potential to resolve some issues using OpEval II data**

- **OpEval II will not satisfy all operational approval requirements**

Selected Operational Approval Issues

- Will there be any differences in planned intended (i.e., end-state) functionality or design for the equipment when installed in other make / model aircraft? If so, how might these possible different equipage implementations affect mixed equipage crew performance during normal and abnormal flight operations?
- How will ADS-B functional capability for air-ground operations (and degraded capability in case of a degraded system) be conveyed to ATC? What will be the requirements to advise ATC of a degraded system? How effective will this procedure be?
- Evaluate aircraft with various approach and departure speeds for the approach and departure spacing applications to assess real-world mixed aircraft arrivals/departures. How will various climb gradient differences impact departure spacing? What are the limits of the departure spacing application?
- There needs to be work done to evaluate how a pilot / pilot-not-flying will transition from an en route CDTI display depiction to an instrument approach / CDTI depiction, then to an CDTI airport map depiction, and still maintain situational awareness. (Note: Not all three CDTI depictions are planned for OpEval II, at least not for the transport category aircraft).